# Wire Plating Machine User Manual
## (Manual and automatic)

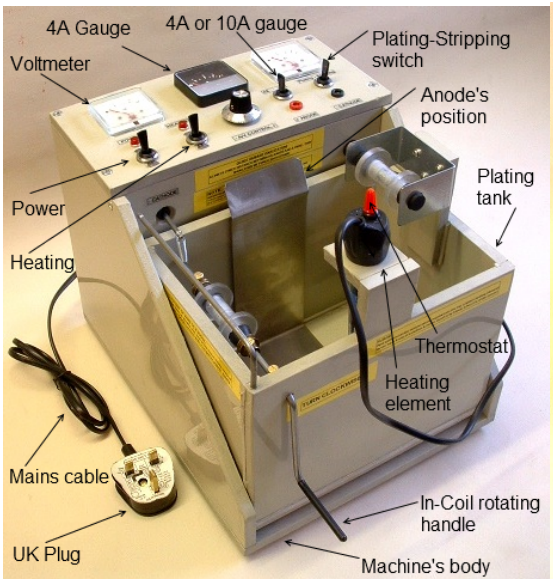
### 1. Designation

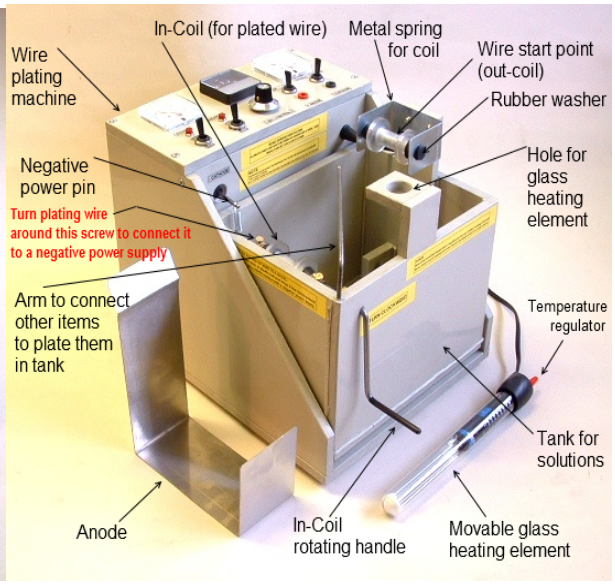
This wire plating machine is designated for

1. **WIRE ELECTROPLATING process;**
2. **WIRE STRIPPING process (stripping old surface from wires before re-plating);**
3. **WIRE CLEANING process (cleaning wires before other processes for best quality).**
4. **ELECTROPLATING ALL OTHER objects.**
5. **CLEANING & STRIPPING ALL OTHER objects.**

### 2. Machine Applications

These processes are widely used in electronics industry, machinery, decorating, crafts, arts, etc. The Unit may be used for professional coating of all sorts of metal wires. You can use it also for coating all other parts suitable for this tank. A number of these machines may form a production line. This machine has a movable tank to facilitate easy changing of the solutions.





In-Coil (for plated wire)
Metal spring for coil
Wire start point (out-coil)
Wire plating machine
Rubber washer
Negative power pin
Hole for glass heating element
Turn plating wire around this screw to connect it to a negative power supply
Arm to connect other items to plate them in tank
Temperature regulator
Tank for solutions
Anode
In-Coil rotating handle
Movable glass heating element

### 3. Performance

The Unit is adaptable to 110-120 Vac (USA/CANADA) or 220-240 Vac (UK&EU). It secures electric current from 0 to 10 Adc (on 7Vdc) and voltage of up to 15 Vdc.
This machine is fully suitable for plating wires from 0.05mm to 1.6 mm in diameter and can plate them in gold, rhodium, copper, nickel, silver, bronze, zinc, chrome, brass etc.
Thickness and quality of a coating is a complex function of electric current, voltage, temperature of a solution, time of exposure, quality of salt and plater's experience.

## 4. Delivery Specification

Please check that the delivery includes the following components:

- Machine with tank;
- Movable cathode metal rod for non-wires plating objects;
- One stainless steel anode;
- A set of leads;
- 50 Watt glass heating element:
- 4 mm small metal pin with a connecting spring.

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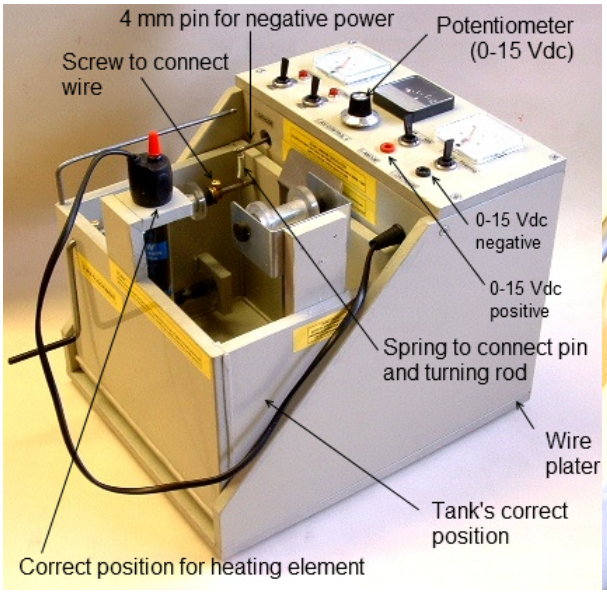
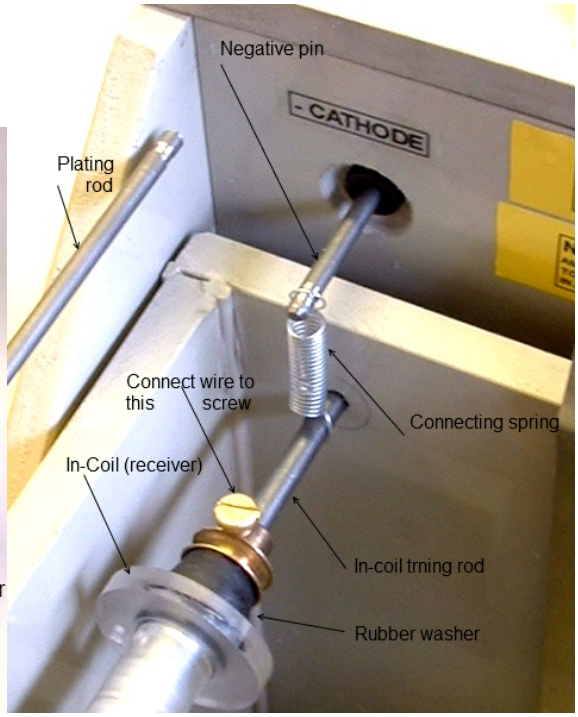
Please note: we reserve the right to introduce changes in the appearance of the equipment delivered without affecting its working parameters.

## 6. Installation and Operation

Installation and operation of this Unit does not need deep professional knowledge or specific training and can be used by both professionals and beginners alike.
After checking that you have all materials place the machine in a suitable level position please ensure that the location where you will use your machine is strong enough to support the full weight of around 10 kg. Prior to switching the machine "On" make sure that the potentiometer (the handle with digits (pointer) on the front panel) is in the far left position.


4 mm pin for negative power
Potentiometer (0-15 Vdc)
Screw to connect wire
0-15 Vdc negative
0-15 Vdc positive
Spring to connect pin and turning rod
Wire plater
Tank's correct position
Correct position for heating element




Place tank in the correct position between walls of the machine.
Insert small (4 mm) metal pin into a cathode black socket as shown on the left picture above and connect it to the rotating (In-coil turning) rod by the spring attached.
Insert a glass heating element into its hole as shown on the right picture above and turn the red handle (thermostat) to far left position (switched Off).

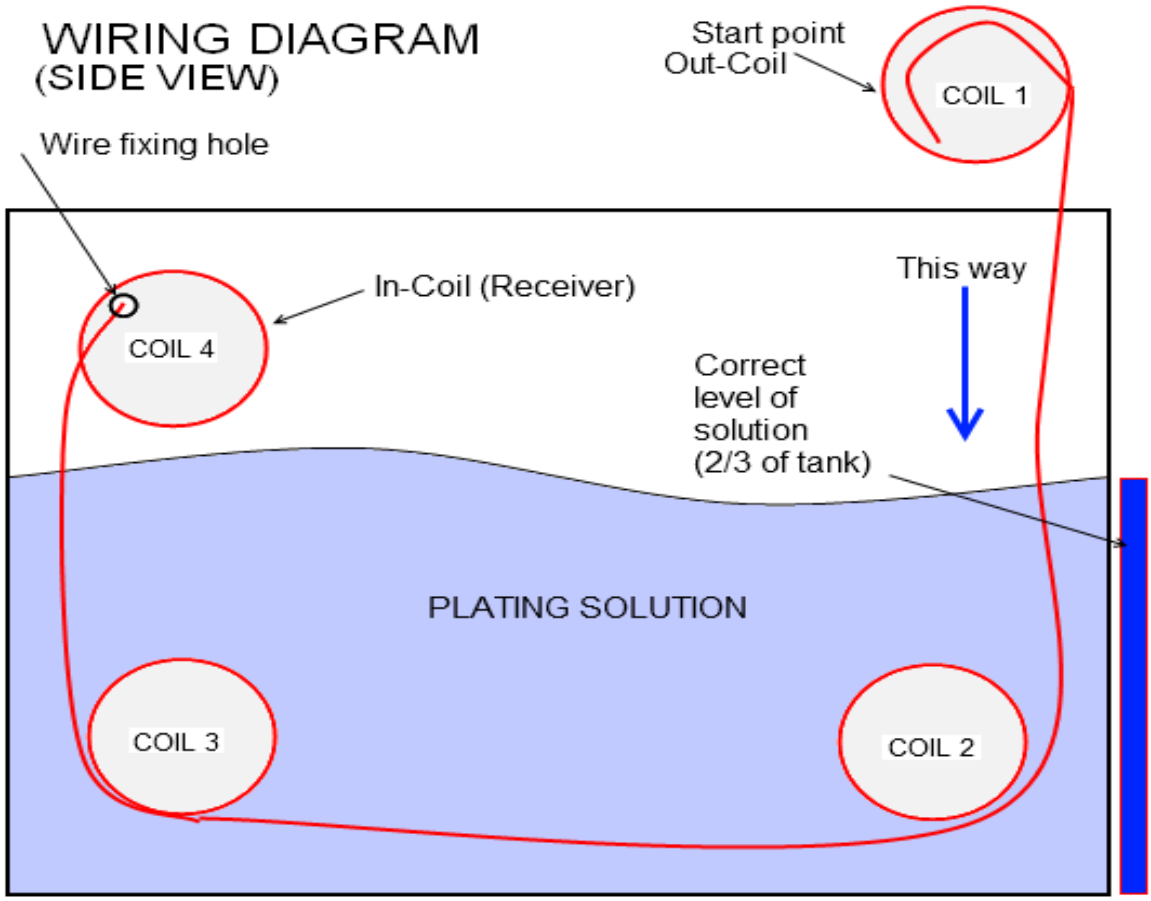
Now place a correct anode (a stainless steel anode for Gold/Silver plating processes and for cleaning supplied with this machine) inside the tank. Please move it carefully between an Out-Coil (right top) and a heating element's stand. Please find the correct anode's position on the first picture of this manual.

**Now you can start connecting the wire to be plated.** In order to do that

- Carefully straighten the flat metal spring that fixed Out-Coil (right top) in its position and take this plastic coil out. Wrap the wire that you wish to plate around this coil and place the coil back in its position.

**Important:** Please ensure that this coil sits in its position properly and cannot be loosened It should move only with applying some effort in order to avoid slackening of the wire, as well as the wire touching the anode and jerky motions while uncoiling. It is also highly desirable in order to achieve the wire being wrapped around the coil without applying significant force and coil to coil. You can also use a ready pre-wire-wrapped coil if it fits size-wise. Bend and straighten the spring eyes until the correct position is found where the rubber washers of the coil squeeze it in the way that it can rotate with a minimal effort without however being loose.

- Place the wire between the coils as shown in the diagram below:




- Fix the wire on the receiver (In-coil) putting the end of the wire through the coil opening 4 and coiling the wire end a few times round the nearest screw in order to connect this wire end to the negative power supply.

**Important:** Please make sure that the wire has a sufficient contact with the screw and it properly fits the screw only after it has been put through the coil opening. Please also make sure that the receiver (In-coil) is fixed to its metal bar properly and does not move

around. If it moves around please press both rubber washers together and fix them by the metal pulleys from both sides of the coil and then fix them properly using the screws.
- Now connect the red wire to the red socket on the front panel and connect the other end (crimp) to the top of the anode placed inside the tank.
- **Important:** Please make sure that the crimp is placed on the anode at a higher level than the level of the solution.

**7.** Fill the bath with the desired solution to the correct level (2/3 of the tank).

**7.** Switch "On" a glass heating element by using the switch placed on the front panel and turning the thermostat (small handle on the top of the heating element) clockwise. Heat the solution inside the tank up to the required level (Usually it is between 30 C - 60 C) and ensure that the left switch "Plating-Stripping" is on "Plating" position.

**8.** Now you can pre-set the potentiometer by using the handle in the correct position to get the required voltage and start moving the rotating handle outside the tank CLOCKWISE. Some tests will be required in order to find the correct speed of the handle.

**Important:** Just remember – more RPM equals a thinner layer. Normal speed for most plating processes is about 4-6 RPM in order to get a 7-10 microns layer. If the pre-working preparation of the machine is performed in a proper way the wire will start wrapping around the receiver (in-coil) having already been covered by the desired metal. If the wire moves with a significant effort the clamp of the Out-Coil should be released. If the receiver (In-Coil) roll becomes loose tighten it stronger between the rubber washers.

PLEASE ALSO REMEMBER THAT MOST WIRE PLATING PROCESSES REQUIRE ONLY 0.2-0.5 A/INCH AND IF THIS PROCESS IS FOLLOWED CORRECTLY THEN YOUR AMMETERS WILL NOT SHOW AMPHERAGE AT ALL.

You will require these ammeters only when plating large objects.

**9. Stripping process:** Please use a "Plating-Stripping" switch on the front panel to both plate and strip old layers before replating. You can use this process for any types of item.

**10.** If you want to plate other objects (other than wires) just connect this object by copper or aluminium wire to an arm (movable rod on the bottom left corner of the tank) and immerse this object into the solution. Of course you will still need to connect an anode inside the tank (red lead, red socket, positive power supply) and a plating object (black lead, black socket, negative power supply). Then just turn potentiometer to the correct position (usually between 7-9 volts) and see the result in about 10 seconds or slightly longer. As with a wire plating process you will require some experience to get a high quality result of your works.

**Important:** When you start to plate a large object in the tank please use a 10 A gauge (a switch on the front panel) and switch it to a 4 A gauge only if the 10A gauge coil does not move.

**11.** A Pen or Brush electroplaters can be connected to this machine because it has standard 4 mm spring red and black sockets on its front panel.

To prepare your articles and make sure that they are suitable for plating it is important to ensure that all oil, grease, paint or other materials are removed prior to processing. The most common cause of poor quality of your production is insufficient preparation so always use a cleaning process before plating!

## 12. Common problems during a wire plating process:

If your wire does not plate:

- Make sure that your machine is connected to a power supply and is switched "On".
- Check if it is connected to a screw on turning rod properly.
- Check if the small pin is connected to the rotating rod by spring.
- Check if your anode is connected by a red lead to a red socket on the front panel of the machine.
- Check if your wire IS NOT COVERED BY CLEAR WARNISH! It is a common problem for beginners.
- Check if your potentiometer is turned to a correct position and voltmeter shows voltage between 7 and 9 Volts.
- Check if the left switch is still on "Plating" position.
- Check your solution and the anode (if it is the correct one for this process).

## 13. Disposal of chemicals

Check with your solution supplier in order to find the level and type of chemicals you may dispose of. Pay particular attention if your waste system discharges into any pools, ponds or streams.
Electrolytic cleaner: does not contain strong alkali or Cyanides. Dilute with 10 times the volume of water and flush away.
Gold plating solutions: all solutions contain Cyanides in some form and must be treated to change this chemical into Cyanides. The addition of 100 ml. of Sodium Hypochlorite per litre of gold forming solution followed by stirring in a well ventilated place will treat normal solutions. Sodium Hypochlorite is available from laboratory suppliers or swimming pool chemical suppliers.
Rhodium forming solution: not suitable for neutralisation for removing toxicity, these solutions should be returned to authorised companies for treatment when a certain quantity has been accumulated.

## 14. Maintenance

Always make sure that the Unit is clean and stored in a dry place.

## 15. Safety Precautions

All processes are subject to two main hazardous effects: electrical injury and poisoning by solutions and their gases.
To avoid electrical injury the user must not touch bare leads of the machine with unprotected hands and always use rubber gloves. This will also be useful to protect hands from the effects of a solution. It will also be necessary to provide operation area with a rubber carpet and stand on it.
Many of the chemicals used for work with electroplating units are deadly poisons and their combinations often produce corrosive and poisonous gases. Therefore, all general safety measures should be undertaken when working with them including keeping them away from children avoiding eye contact, skin contact and inhalation at any time.
Proper ventilation of the work area should be ensured.
Rules of working with chemicals are provided by their manufacturers with every chemical item. The user should carefully follow all the instructions.